

CLAIMS

1. Device for determining the absolute angular position of a turning device with respect to a fixed structure, where said device includes:

5 an encoder adapted for rotation together with the turning device, said encoder includes a main multipolar track and a top turn track which are concentric, said top turn track includes M angular distributed singularities;

a fixed sensor arranged with regard to a gap distance of the encoder including at least three sensing elements where at least two are positioned with regard to the main multipolar track so as to deliver two periodic signals S1, S2 in quadrature and at least one is positioned with
10 respect to the top turn track so as to deliver an electrical signal S3, the sensor includes an electronic circuit capable of delivering, starting from the signals S1, S2 and S3, two squared digital position signals (A, B) in quadrature which are representative of the angular position of the turning device and one top turn signal (C) in the form of M pulses per revolution of the
15 encoder;

one processing device of the signals (A, B, C) which includes an appropriate means of counting, to determine, starting from an initial position, variations of the angular positions of the encoder;

in which the M singularities are angularly distributed so that the top turn signal (C) is
20 arranged so as to define, together with the signals (A,B), the binary sequences which are each representative of an absolute angular position of the encoder, the processing device includes means for updating the initial position which, at the time of detecting a binary sequence, are suitable to assign, with regard to the initial position, the absolute angular position value associated with each binary sequence.

25 2. Device according to claim 1, further comprising revolution discrimination means in which the absolute angular position is determined.

3. Device according to claim 1, characterized in that the top turn track includes N sectors
30 each provided with M/N angular distributed singularities.

4. Device according to claim 3, further comprising a means of sector discrimination via which the angular position is determined.

5. Device according to claim 3, characterized in that the angular distribution of the M/N singularities is identical for each sector.

6. Device according to claim 1, characterized in that each multipolar track is formed by a magnetic ring on which equidistributed North and South poles are magnetized with a constant angle width, a magnetic singularity from the top turn track is formed by two adjacent poles where the magnetic transition is different from others.

7. Bearing equipped with a determination device according to claim 1, of a type including a fixed bearing race intended to be associated with a fixed device, a turning bearing race intended to be set in rotation by the turning device and bearings arranged between these races, said bearing is characterized in that the encoder is associated with the turning bearing race.

8. Bearing according to claim 7, characterized in that the sensor is associated with the fixed bearing race of the bearing.

9. Steering system for automobile, characterized in that it includes a device according claim 2, the encoder is solidly in rotation with a steering wheel of a vehicle and the sensor, so as to measure the absolute angular position measurement of the steering wheel.

10. System according to claim 9, characterized in that the revolution or sector discrimination means includes a means for analyzing the differential speed of vehicle wheels.

11. System according to claim 9, characterized in that the means for discrimination of the revolution or sector includes an accelerometer or a gyroscope.